CLAIMS

What is claimed is:

1. A CMP conditioner comprising a protrusion protruded from an upper surface of a base which rotates around an axis line and a plurality of abrasive grains fixed to the protrusion, wherein the abrasive grains are fixed such that the abrasive grains are not protruded from a virtual extending surface which extends from the periphery of a protrusion section, which faces a protrusion direction of the protrusion, along the axis line.

2. The CMP conditioner according to Claim 1, wherein the plurality of abrasive grains is fixed on the protrusion section in a region separated from the virtual extending surface by at least a fourth of the average grain diameter of the abrasive grains.

3. The CMP conditioner according to Claim 2, wherein, among the plurality of abrasive grains, the abrasive grains closest to the periphery of the protrusion section are fixed in a region from the virtual extending surface to a position separated from the virtual extending surface by three times the average grain diameter of the abrasive grains.

4. The CMP conditioner according to Claim 1, wherein the protrusion is formed in a cylindrical shape and has the protrusion section perpendicular to the axis line and an outer circumferential wall surface which rises from the upper surface of the base toward the protrusion section around the protrusion section, and the abrasive grains are fixed such that the abrasive grains are not protruded outwardly from the virtual extending surface, which extends from an outer periphery of the protrusion section of the protrusion.

5. The CMP conditioner according to Claim 1, wherein the protrusion is formed in a substantially annular shape at an outer circumference of the upper surface of the base and has the protrusion section having a substantially annular shape and perpendicular to the axis line and an inner circumferential wall surface which rises from the upper surface of the base toward the protrusion section at an inner circumference of the upper surface of the base, and the abrasive grains are fixed such that the abrasive grains are not protruded from the virtual extending surface, which extends from an inner periphery of the protrusion section of the protrusion, to the inside of the upper surface of the base.

6. The CMP conditioner according to Claim 1, wherein, on the upper surface of the base, a tetrafluoride-based organic compound is coated on at least the protrusion section of the protrusion.

7. The CMP conditioner according to Claim 2, wherein the protrusion is formed in a cylindrical shape and has the protrusion section perpendicular to the axis line and an outer circumferential wall surface which rises from the upper surface of the base toward the protrusion section around the protrusion section, and the abrasive grains are fixed such that the abrasive grains are not protruded outwardly from the virtual extending surface, which extends from an outer periphery of the protrusion section of the protrusion.

8. The CMP conditioner according to Claim 3, wherein the protrusion is formed in a cylindrical shape and has the protrusion section perpendicular to the axis line and an outer circumferential wall surface which rises from the upper surface of the base toward the protrusion section around the protrusion section, and the abrasive grains are fixed such that the abrasive grains are not protruded outwardly from the virtual extending surface, which extends from an outer periphery of the protrusion section of the protrusion.

9. The CMP conditioner according to Claim 2, wherein the protrusion is formed in a substantially annular shape at an outer circumference of the upper surface of the base and has the protrusion section having a substantially annular shape and perpendicular to the axis line and an inner circumferential wall surface which rises from the upper surface of the base toward the protrusion section at an inner circumference of the upper surface of the base, and the abrasive grains are fixed such that the abrasive grains are not protruded from the virtual extending surface, which extends from an inner periphery of the protrusion section of the protrusion, to the inside of the upper surface of the base.

10. The CMP conditioner according to Claim 3, wherein the protrusion is formed in a substantially annular shape at an outer circumference of the upper surface of the base and has the protrusion section having a substantially annular shape and perpendicular to the axis line and an inner circumferential wall surface which rises from the upper surface of the base toward the protrusion section at an inner circumference of the upper surface of the base, and the abrasive grains are fixed such that the abrasive grains are not protruded from the virtual extending surface, which extends from an inner periphery of the protrusion

section of the protrusion, to the inside of the upper surface of the base.

11. The CMP conditioner according to Claim 2, wherein, on the upper surface of the base, a tetrafluoride-based organic compound is coated on at least the protrusion section of the protrusion.

12. The CMP conditioner according to Claim 3, wherein, on the upper surface of the base, a tetrafluoride-based organic compound is coated on at least the protrusion section of the protrusion.

13. The CMP conditioner according to Claim 4, wherein, on the upper surface of the base, a tetrafluoride-based organic compound is coated on at least the protrusion section of the protrusion.

14. The CMP conditioner according to Claim 5, wherein, on the upper surface of the base, a tetrafluoride-based organic compound is coated on at least the protrusion section of the protrusion.